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Mindfulness-Based Stress Reduction in Massachusetts Correctional Facilities

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Mindfulness-based stress-reduction courses were offered in drug units in six Massachusetts Department of Corrections prisons. A total of 1,350 inmates completed the 113 courses. Evaluation assessments were held before and after each course, and highly significant pre- to post-course improvements were found on widely accepted self-report measures of hostility, self-esteem, and mood disturbance. Improvements for women were greater than those for men, and improvements were also greater for men in a minimum-security, pre-release facility than for those in four medium-security facilities. The results encourage further study and wider use of mindfulness-based stress reduction in correctional facilities.

Keywords: *mindfulness-based stress reduction; meditation; stress reduction; substance abuse*

Individual criminal behavior has been attributed to an inadequate ability to effectively deal with severe stress, deprivation, and low self-esteem, and with peer pressure and the codes of behavior of groups such as gangs. These factors can be severely compounded by the injection or ingestion of drugs and alcohol, which offer the user relief from emotional discomfort by impairing or eliminating normal levels of awareness and impulse control.

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Under such circumstances, intense feelings such as fear, frustration, anger, and greed can rapidly result in antisocial behaviors, and the resultant incarceration in correctional institutions brings additional stress, with the possibility of further exacerbating these conditions (Fogel, 1993; Perkins, 1998).

The regular practice of meditation has been shown to help individuals cultivate deep and long-lasting experiences of inner calm, well-being, self-worth, and self-respect (Kabat-Zinn, 1993). For this reason, there has been increasing interest in recent years in the efficacy of meditation-based interventions in correctional institutions as a means of helping inmates deal with the stress of incarceration and to acquire life-long inner resources to decrease the likelihood of continuing criminal behavior and recidivism. The rationale is that through the regular practice of meditation, inmates can grow to be less reactive to intense emotional states without resorting to the use of drugs or other chemical substances (Kabat-Zinn, 1993). There are reports of prison-based studies of Vipassana meditation (Anonymous, 2000; Marlatt et al., 2004; Parks et al., 2003), transcendental meditation (TM; Alexander et al., 2003; Hawkins et al., 2003; Orme-Johnson & Moore, 2003; Shanmugam, 1992), and mindfulness meditation (Murphy, 1995; Perkins, 1998). The present study is based on a program of mindfulness meditation.

Mindfulness is a sustained nonreactive attention to one's ongoing mental contents and processes (physical sensations, perceptions, affective states, thoughts, and imagery) (Grossman, Niemann, Schmidt, & Walach, 2004; Kabat-Zinn, 2005; Miller, Fletcher, & Kabat-Zinn, 1995). Mindfulness is traditionally cultivated through formal training in mindfulness meditation, and the resultant stable, nonreactive awareness appears to act as a resource for more creative responding by bringing mental processes into greater conscious awareness and under greater voluntary control (Shapiro & Walsh, 2002). Moreover, because this natural capacity is under the individual's direct control, it can provide an experience of mastery (self-efficacy), so that thoughts and intense feelings no longer threaten to overwhelm (Teasdale, 1999; Teasdale et al., 2000). For many inmates, this may be their first experience of inner control of mind or body states.

Mindfulness-based stress reduction (MBSR) is an 8-week program of intensive training in mindfulness (moment-to-moment awareness) and its integration into everyday life. MBSR was developed at the University of Massachusetts (UMass) Medical Center in 1979 by Dr. Jon Kabat-Zinn (1990) to provide a coping resource for patients dealing with intense physical symptoms, chronic medical conditions, and difficult emotional situations (Kabat-Zinn, 1994). Since that time, more than 16,000 people with a wide range of disorders and difficult life situations have completed

the ongoing program at UMass, and programs based on Kabat-Zinn's model are now widely available throughout the United States and in other countries. The MBSR program has also been used in stressful inner-city community settings (Roth & Creaser, 1997; Roth & Stanley, 2002) and in a therapeutic community for substance abuse treatment (Marcus et al., 2003). Reports have demonstrated a high level of adherence or compliance with the behavioral demands of MBSR (Kabat-Zinn & Chapman-Waldrop, 1988; Specia, Carlson, Goodey, & Angen, 2000; Williams, Kolar, Reger, & Pearson, 2001), with about 85% of enrollees completing the program. A number of studies have demonstrated positive attitudinal, health, and behavioral changes associated with MBSR (Kabat-Zinn, 1982; Kabat-Zinn, Lipworth, & Burney, 1985; Miller et al., 1995). These changes include improvements in psychological and physical well-being and reductions in anxiety and depression (Kabat-Zinn, 1992; Kaplan, Goldenberg, & Galvin-Nadeau, 1993; Teasdale et al., 2000). The changes have been found to endure at 3-month follow-up (Williams et al., 2001), 6-month follow-up (Carlson, Ursuliak, Goodey, Angen, & Specia, 2001) and 4-year follow-up (Kabat-Zinn, Lipworth, Burney, & Sellers, 1987). The MBSR program has also been adapted and integrated into a variety of other clinical and nonclinical settings (Kristeller & Hallett, 1999; Linehan, 1993; Saxe et al., 2001; Teasdale et al., 2000).

Based on the belief that some of the psychological factors that lead to criminal behavior may be changed through the practice of mindfulness (Kabat-Zinn, 1993), the UMass Stress Reduction Clinic and the Massachusetts Council on Criminal Justice agreed to conduct a program of MBSR in prisons in the Massachusetts Department of Corrections system. The MBSR program was one of several options offered in a rehabilitation program for inmates incarcerated as a result of drug-related convictions. The program was not designed or conducted as a formal research study, and limitations imposed by administrative constraints, and the need to adapt to differences among the various prison settings, necessitated some modifications from the way in which MBSR programs are usually conducted at UMass (Kabat-Zinn, 1990) and elsewhere.

Method

MBSR

The foundations and methodology of MBSR have been described in detail elsewhere (Kabat-Zinn, 1990; Santorelli, 1999). Briefly, in the more usual

clinical setting, approximately 20 participants attend 8 weekly, 2.5-hour classes and an all-day, mostly silent retreat or intensive experience during the sixth week. During these sessions, participants receive training in mindfulness through a body scan meditation, sitting meditation, and mindful stretching exercises. There is a good deal of group discussion on the integration of mindfulness into everyday life and the application of mindfulness as a method for noticing habitual reactions to stressful situations and more creatively responding (Kabat-Zinn, 1990). Some didactic material on the psychology and physiology of stress reactivity is also presented. Participants are expected to engage in formal mindfulness meditation practice for 45 minutes per day outside of class, guided by audiotapes or CDs that are provided.

Correctional Institution Settings, Environment, and Program

Approximately 2,000 inmates participated in the MBSR program in six correctional institutions in Massachusetts between 1992 and 1996. The programs were offered in the Massachusetts women's prison at Framingham and in five correctional institutions for men—the four medium-security facilities at Shirley, Gardner, Norfolk, and Old Colony and at the minimum-security, pre-release facility at Shirley. The MBSR program was offered as one of a variety of options, in 6- to 8-week blocks, to inmates in drug units within these institutions. The other options included smoking cessation, literacy training, and exercise and walking programs. All were aimed at providing inmates with nondestructive outlets, with the potential to enrich their lives both in prison and after release. Inmates who completed one of the offered rehabilitation programs could earn earlier release.

Each MBSR course was limited to 12 to 20 participants. Facilities and conditions differed somewhat in each institution. At one extreme, there was a quiet private room dedicated to the MBSR program; at the other extreme, classes were held in the corner of a large open gym where other inmates were exercising during the MBSR classes. In the medium-security institutions, inmates were escorted to each class by a correctional officer who, in some settings, remained throughout the classes. Exercise mats, for the mindful stretching, and meditation cushions were not always available in all settings. Depending on each institution's overall program schedule, class sessions varied from 1 to 1.5 hours. In some cases, where individual classes were shorter, two sessions were held per week. Course lengths varied from 6 to 8 weeks. In no case was there an opportunity for the all-day retreat or intensive experience. Opportunities for independent daily meditation practice outside of class were minimal, and shared cells and other constraints of

prison life limited the ability to practice alone and in relative quiet. Institutional regulations prevented the use of tape players in cells, but one tape and one player were made available for group practice outside of class. Although no records were kept, many inmates reported using the techniques informally.

Evaluation

During a 30-minute orientation session held 1 week prior to the start of each course cycle, the demands and possible benefits of participation in the MBSR program were explained to inmates. Following this session, inmates completed the set of self-report psychosocial measures described below. Responses obtained at this time were designated "pre-course." A second set of these measures was completed at the end of each course and was designated "postcourse." Only data for inmates with appropriate paired pre- and postcourse self-report measures and an intervening course were included in analyses of course completers. Completion of the course was defined as having attended at least 80% of the classes in the cycle.

Because this program was not conducted as a formal research project, there were no formal controls. However, in some of the settings, institution-specific scheduling and administrative circumstances resulted in significant numbers of inmates completing paired self-report measures (with an intervening period equivalent to that of the MBSR course), without having participated in an MBSR course during that time.¹ A subset of this group then participated in an MBSR course in the following cycle and subsequently completed a third set, post-course, of the self-report measures at the end of the course. These inmates provided the data for what may be characterized as "quasi-waitlist controls."

Another subset of inmates who had completed the usual paired pre- and post-program self-report measures with an intervening MBSR course subsequently completed a third set of evaluation measures after a further course-length interval but without a second intervening MBSR course. These inmates provided the data for what may be characterized as a "quasi-follow-up group."

The following instruments were used in the evaluation.

Cook and Medley Hostility Scale

Derived from items in the MMPI, the Cook and Medley Hostility Scale (Barefoot, Dodge, Peterson, Dahlstrom, & Williams, 1989), a 50-item

scale, assesses cognitive, affective, and behavioral components of hostility. Higher scores indicate greater hostility, reflecting distrust, cynicism, and a tendency to respond aggressively. Although the data were analyzed for the six subscales—Hostile Attribution, Hostile Affect, Hostile Aggression, Aggressive Responding, Cynicism, and Social Avoidance—for reasons of space, only total scores are reported.

Rosenberg Self-Esteem Scale

The Rosenberg Self-Esteem Scale (Rosenberg, 1979) is a widely used, 10-item, unidimensional measure of global self-esteem, defined as a favorable or unfavorable attitude or feelings toward oneself. Higher scores indicate greater self-esteem.

Profile of Mood States

Profile of Mood States (McNair, Lorr, & Droppelman, 1992) is a measure of a person's awareness of his or her state of mental buoyancy or distress. The scale assesses the respondent's transient, fluctuating affective states by asking how well each of 65 adjectives describe the respondent's feelings in the past week. Higher scores indicate greater mood disturbance. The scale has been shown to be responsive to MBSR programs (Carlson et al., 2001; Kabat-Zinn, 1982; Kabat-Zinn et al., 1985; Specia et al., 2000) and to other meditation and yoga interventions (Woolery, Myers, Sternlieb, & Zeltzer, 2004). Although data were analyzed from the subscales assessing six dimensions of mood (tension/anxiety, anger/hostility, vigor/activity, depression/dejection, fatigue/inertia, and confusion/bewilderment), for reasons of space, only total mood disturbance (TMD) is presented here.

Statistical Analyses

Change scores were calculated between pre- and post-program values for all variables, and paired *t* tests were performed to determine within-group differences.

Results

Table 1 shows that records were kept on 1,953 inmates enrolled in 113 MBSR course cycles offered in the drug units within the six correctional

Table 1
Program Enrollment and Completion

	Men		Women		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Number of courses offered (all sites)	86		27		113	
Initial enrollment	1,486		467		1,953	
Completion (attending 80% or more of classes in a course)	1,050	71	300	64	1,350	69

settings. The 86 courses offered in the men's units included 66 at the four medium-security facilities and 20 at the minimum-security, pre-release facility. In addition, 27 courses were offered at the women's facility at Framingham. Also shown are course completion rates; for the 1,953 inmates who attended a first class, 1,350 (69%) met the criteria for course completion.

Results for the Cook and Medley Hostility Scale are shown in Table 2.² Similar pre-course scores were found at all sites, and post-course scores showed significant reductions ($p = .0001$) at all sites, suggesting reduced hostility in these inmates. The reductions were greater for the women (9.2%) than for the men (7.0%). The reduction in hostility scores for inmates in the men's minimum-security facility (9.4%) was significantly ($p = .05$) greater than that of the men in the medium-security facilities (6.4%). All six subscales showed statistically significant post-MBSR course improvement (data not shown).

Changes in scores on the Rosenberg Self-Esteem Scale are shown in Table 3. Statistically significant increases (suggesting increased self-esteem) were found in all settings. A significantly ($p = .006$) greater percentage increase (8.3%) was found in the women's facility than for all the men (3.8%). Men in the minimum-security, pre-release facility showed greater improvement in self-esteem scores (6.8%) than did the men in the medium-security facilities (3.1%).

As shown in Table 4, improvements in the TMD scores on the Profile of Mood States Scale were the most dramatic. Greater mean baseline distress was found for the women inmates ($M = 63.4$) than for the men at either the minimum-security, pre-release site ($M = 47.6$) or the medium-security sites ($M = 45.6$). Although the women's post-course scores remained relatively high ($M = 39$), their percentage reductions (38.5%), were significantly greater ($p = .0001$) than those for the men (28.4%). Total percentage reductions in

Table 2
Cook and Medley Hostility Scale

	<i>n</i>	Pre-MBSR		Post-MBSR		% Change	<i>p</i>
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
All sites	948	25.4	8.1	23.5	8.7	7.5	.0001
Women	201	25.4	8.2	23.0	9.1	9.2	.0001
Men	747	25.4	8.0	23.6	8.6	7.0	.0001
Men, minimum	147	25.6	7.9	23.2	9.0	9.4	.0001
Men, medium	600	25.3	8.1	23.7	8.5	6.4	.0001

Note: MBSR = mindfulness-based stress reduction.

Table 3
Rosenberg Self-Esteem Scale

	<i>n</i>	Pre-MBSR		Post-MBSR		% Change	<i>p</i>
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
All sites	955	29.3	6.4	30.7	6.7	4.7	.0001
Women	202	28.4	5.6	30.8	5.7	8.3	.0001
Men	753	29.5	6.6	30.6	6.9	3.8	.0001
Men, minimum	147	30.3	5.5	32.4	6.0	6.8	.0001
Men, medium	606	29.3	6.8	30.2	7.0	3.1	.0002

Note: MBSR = mindfulness-based stress reduction.

mood disturbance for the men at the minimum-security, pre-release facility (31.0%) were greater than those of the men in the medium-security facilities (27.7%). All six subscales also showed statistically significant improvements following inmates' completion of the MBSR course (data not shown).

Scores for the subset of inmates whose pattern of participation in the program and sequence of evaluations qualified them as quasi-waitlist controls are shown in Table 5. No significant change ($p > .05$) on any of the three measures was found in the period prior to participation in the MBSR course, but significant changes, comparable to those already described in Tables 2, 3, and 4, were seen in scores following completion of a course. These scores

Table 4
Profile of Mood States—Total Mood Disturbance

	<i>n</i>	Pre-MBSR		Post-MBSR		% Change	<i>p</i>
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
All sites	907	49.8	39.7	34.2	36.7	31.2	.0001
Women	196	63.4	43.5	39.0	38.5	38.5	.0001
Men	711	46.0	37.8	32.9	36.1	28.4	.0001
Men, minimum	147	47.6	36.8	32.8	35.3	31.0	.0001
Men, medium	564	45.6	38.0	33.0	36.3	27.7	.0001

Note: MBSR = mindfulness-based stress reduction.

Table 5
Quasi-Waitlist Comparison Group

	<i>n</i>	Mean Change	% Change	<i>p</i>
Cook and Medley Hostility				
Pre-MBSR (8-week interval)	180	-0.6	2.4	.17
MBSR course outcomes	180	-2.14	8.6	.0001
Rosenberg Self-Esteem				
Pre-MBSR (8-week interval)	181	0.48	1.6	.39
MBSR course outcomes	181	2.05	6.8	.0001
Profile of Mood States—TMD				
Pre-MBSR (8-week interval)	161	-2.12	5.0	.37
MBSR course outcomes	161	-12.21	30.6	.0001

Note: MBSR = mindfulness-based stress reduction; TMD = total mood disturbance.

provide strong support for the conclusion that the described pre- to post-course improvements are attributable to participation in an MBSR course.

Table 6 shows the results for the subset of inmates characterized above as a quasi-follow-up group. Following completion of the course, this group also showed improvements on all scales (statistically significant for all scales except the Rosenberg) comparable to those described in Tables 2, 3, and 4. The absence of further significant change on any of the measures in the follow-up period suggests that the improvements previously described were maintained in spite of an additional 6 to 8 weeks of incarceration.

Table 6
Quasi-Follow-Up Group

	<i>n</i>	Mean Change	% Change	<i>p</i>
Cook and Medley Hostility				
MBSR course outcomes	127	-1.46	5.8	.01
Follow-up (8-week interval)	127	-0.04	0.17	.94
Rosenberg Self-Esteem				
MBSR course outcomes	121	0.84	2.8	.08
Follow-up (8-week interval)	121	0.96	3.1	.11
Profile of Mood States—TMD				
MBSR course outcomes	117	-17.1	32	.0001
Follow-up (8-week interval)	117	+2.37	6.5	.37

Note: MBSR = mindfulness-based stress reduction; TMD = total mood disturbance.

Discussion

The results described herein provide strong support for the feasibility and effectiveness of meditation-based interventions in correctional settings. Particularly important is the fact that these significant improvements were found on widely accepted measures of hostility, self-esteem, and mood disturbance.

The pre-course hostility scale scores for both the men and women (25.4), shown in Table 2, are close to one standard deviation above the norm for the general population and similar to those found in psychiatric populations (Han, Weed, Calhoun, & Butcher, 1995). This finding is not surprising given the circumstances of and leading to incarceration. Given the fact that a prison environment can be a very hostile environment, the demonstration of significantly decreased hostility scores in the 6% to 9% range following participation in an MBSR program in these correctional settings is encouraging. In another study, mindfulness meditation led to small reductions in self-reported anger on the State-Trait Anger Expression Inventory, with a slight decrease in aggressive responding at 1-month follow-up (Murphy, 1995). Although none of the other reported studies of meditation in correctional settings used the Cook and Medley Hostility Scale employed here, a number of them provided evidence of reduced hostile and aggressive attitudes and behaviors for participating inmates. Vipassana meditation training was found to increase more positive behaviors in Tihar Jail in India (Kishore, Verma, & Dhar, 1996), and decreased

hostility (Brief Symptom Inventory) in the North Rehabilitation Facility near Seattle (Parks et al., 2003). Similarly, participation in TM programs in a correctional institution led to a decrease in aggression measured on the Buss-Durkee Hostility Inventory (Hawkins et al., 2003) and to decreased aggression (Special Hospitals Assessment of Personality and Socialization Scale) at the maximum-security prison in Walpole, Massachusetts (Alexander et al., 2003).

The significant post-MBSR course improvements (Table 3) in self-esteem provide encouragement that this dimension can also be improved for incarcerated individuals through training in mindfulness meditation. The present findings are similar to results reported for a correctional institution-based TM program, where self-esteem (measured on an ad hoc scale) was shown to increase following program participation (Hawkins et al., 2003).

Baseline TMD scores (46.0) on the Profile of Mood States Scale (Table 4) for male inmates are comparable to those found by Reddon, Marceau, and Holden (1985) for male inmates in a maximum-security psychiatric hospital. The improvements in TMD reported here (38.5% for women and 28.4% for men) are striking and suggest that the affective state of these inmates can be improved substantially by participation in an MBSR program. However, it is noteworthy that even though the women showed a greater percentage of postcourse improvement on the TMD scores; their postcourse scores remained higher (39.0) than those of the men (32.9).

The scores for the subset of inmates characterized as a quasi-waitlist control group are contained in Table 5. There was no significant change for this group on any of the three measures during the interval prior to participating in the MBSR course. During this time, these inmates may or may not have been participating in other activity options, such as the smoking-cessation program or the walking program. Improvements in all three measures were observed following participation in the MBSR course, and the change may reasonably be attributed to participation in the program. Although the follow-up times in this program were shorter than those reported for the MBSR in clinical settings (Carlson et al., 2001; Kabat-Zinn et al., 1987; Williams et al., 2001), the finding that the improvements associated with participation in the program in this setting were maintained for an additional 6 to 8 weeks (Table 6) in the stressful correctional institution environment holds promise for the longer-term endurance of the effects of MBSR programs in supporting inmates in these settings.

Greater improvements were observed for the incarcerated women than for the men on all three of the self-report measures used in this

study, and this is consistent with studies of MBSR in noncorrectional populations (Kabat-Zinn, 1984). It is also evident that the improvements on all of the self-report measures for the men incarcerated in the minimum-security, pre-release facility were greater than those observed for the men in the medium-security facilities. A number of factors might be involved in this finding. The minimum-security, pre-release institution staff demonstrated greater cooperation in implementing the MBSR program in their facility. Also, the minimum-security and prerelease facility houses a combination of less serious offenders and inmates who, though previously housed in medium-security facilities, were awaiting or were near release from their incarceration. These factors might have resulted in greater participant motivation and/or an environment more conducive to the MBSR intervention.

The improvements associated with participation in the MBSR program that were found on all three self-report measures (Tables 2, 3, and 4) and the maintenance of those gains on most of the dimensions for at least 6 to 8 weeks (Table 6) are impressive and very encouraging. Nevertheless, these findings have a number of limitations. The scores are derived from self-report, and respondents might have been inclined to "fake good" from a fear that frank responses might at some point count against them in the institution. We had no records of inmates' compliance with the out-of-class program demands. In addition, our study did not include any examination of inmates' behavior before, during, and after their participation in the MBSR program or of the effects of the program on their substance abuse attitudes, such as cravings. Also, we did not have access to inmate demographics (other than their being incarcerated in drug units) and were not able to follow the participating inmates during a longer period. Nor were we able to measure impacts on recidivism rates.

More compelling will be studies measuring recidivism and the extent of involvement with drugs and alcohol after release, as has been done following participation in a Vipassana meditation program (Marlatt et al., 2004; Parks et al., 2003) and TM interventions in two maximum-security institutions (Alexander et al., 2003; Rainforth, Alexander, & Cavanaugh, 2003). Nevertheless, because this study had the advantage of involving a very large number of participants in multiple correctional sites, including men in medium- and minimum-security facilities and women in another facility, our findings offer considerable promise for the wider use of MBSR programs in prison settings and will hopefully serve as a stimulus for future development of formal research studies of MBSR in correctional settings.

Notes

1. These individuals may or may not have been participating in one of the other program options during that time.

2. The numbers of participants reflected in Tables 2, 3, and 4 vary and are considerably less than the number of program participants shown in Table 1. This is because of the rejection of unpaired questionnaires and the rejection of both the pre- and post-course questionnaires if one of them was unreadable, was incomplete, contained multiple answers for questions, or exhibited a simplistic, regular pattern.

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